VOGON

All Purpose Video Overlay Generator
USER MANUAL

REV: 29th May 2008

Net Video
Unit 1 - Crundalls,
Gedges Hill,
Matfield,
Tonbridge,
Kent,
United Kingdom
TN12 7EA

Tel: +44 (0)1892 722 228
Fax: +44 (0)1892 724 228

info@net-video.co.uk
www.net-video.co.uk

Net Video is a trading name and a division of Raster Vision Ltd.

Contents

1 – What you get 3
2 – Overview 3
3 – Connectors and Controls 4
4 – Hardware Setup 5
5 – Operation 6
5.1 – Power Up 6
5.2 – Setting Size and position 7
5.3 – Changing settings via menu 8
5.3.1 – Crosshair 1 Display Mode 8
5.3.2 – Crosshair 2 Display Mode 8
5.3.3 – Box Positioning Mode 9
5.3.4 – Box Fill Mode 9
5.3.5 – Box Cursor Mode 10
5.3.6 – Coordinate Display 10
5.3.7 – Warning Buzzer 10
5.3.8 – Save Current Setup 11
5.3.9 – Restore Defaults 11
5.3.10 – Product Information 12
5.3.11 – Exit Without Saving 12
5.3.12 – Exit And Save 12
5.4 – Keypad Enable 12
5.5 – Serial Commands 13
5.5.1 – Setup 13
5.5.2 – Serial Command Set 13
5.5.3 – Command Syntax 14
5.6 – Errors 14
5.6.1 – No Video 14
5.6.2 – No PLL lock 14
5.6.3 – Gate Array configuration error 14
6 – Upgrades 15
7 – Specification 15
A – Joystick 17
B – G.P.S 18
C – Mounting Bars 20
D – EMC 21

Note: From time to time this manual is revised and updated. The most recent version will be available for download from our website, commencing in August 2005.

Copyright Net Video 2005.

1 – What you get

Please check that the following items are included in your Vogon package:

- A Vogon Video Overlay Generator
- A 12V DC power supply (requires a local mains supply of 100 – 240 VAC, 50 – 60 Hz)
- A pair of keys for locking the keypad.
- A user manual.
- A CD-ROM containing electronic copies of all documentation.

2 - Overview

Vogon is a highly versatile video overlay generator for use in a wide variety of applications ranging from accurate contact free alignment and measurement through to insertion of time and date stamps on live video, component pick and place through and video surveillance systems.

All Vogon units have the ability to overlay combinations of up to 4 straight lines (2 horizontal, 2 vertical) to generate a number of patterns including crosshairs and boxes making it suitable for application requiring accurate contact free alignment.

Vogon features a menu driven architecture which allows settings to be easily changed by the user. All settings can be saved in non-volatile memory to be reloaded next time Vogon is used.

Vogon uses fully digital positioning so that overlay patterns are free from drift with time or temperature.

Vogon can be controlled by push buttons, remotely using a PC's serial port or using optional rotary controls. Additionally the keypad can be disabled using a key switch to ensure settings remain unchanged. A joystick port is available as an optional item.

Vogon works with PAL and NTSC video formats.

Vogon can have its capabilities extended by purchasing add on software packs available from Net Video. The new software is installed easily using a Windows PC and the Net Video Flash Upgrade Tool.

3 – Connectors and Controls

FRONT

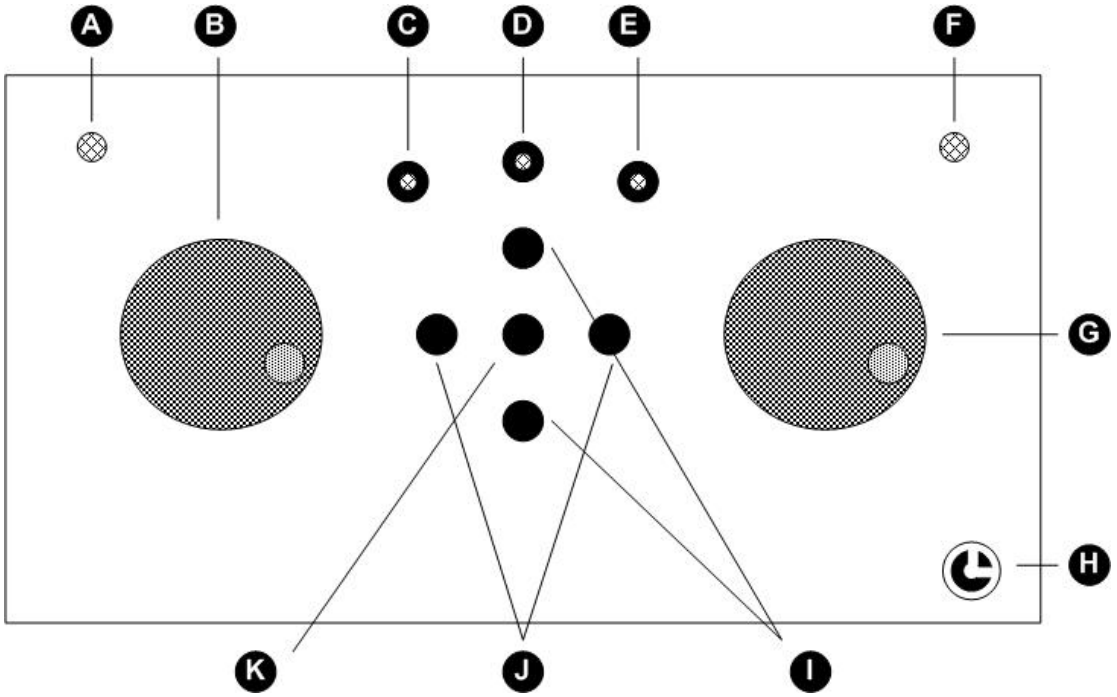


Figure 1: Front panel

A – Power LED
B – X rotary control (left and right)*
C – F1 button
D – MENU/CANCEL button
E – F2 button
F – Keypad Active LED
G – Y Rotary Control (up and down) *
H – Key Switch
I – Up/Down buttons
J – Left/Right buttons
K – OK button
***** Fitted only if specified when ordering.

REAR

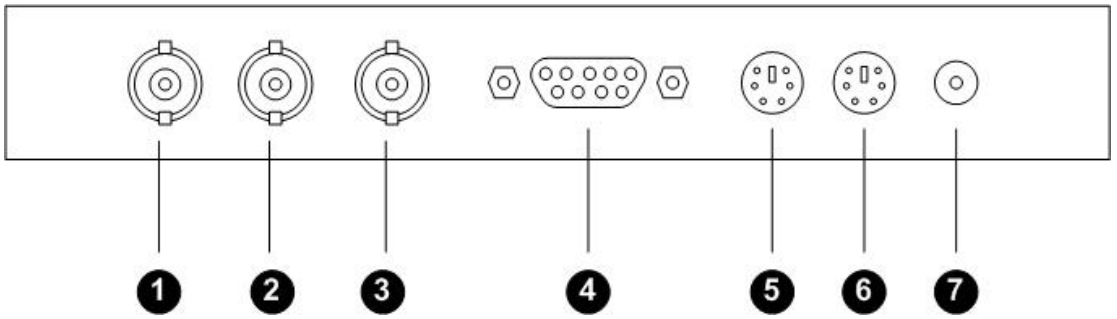


Figure 2: Rear Panel

1 – Video Output 1
2 – Video Output 2
3 – Video Input
4 – RS232 (Serial IO)
5 – Mouse
6 – Keyboard
7 – Power

4 – Hardware Setup

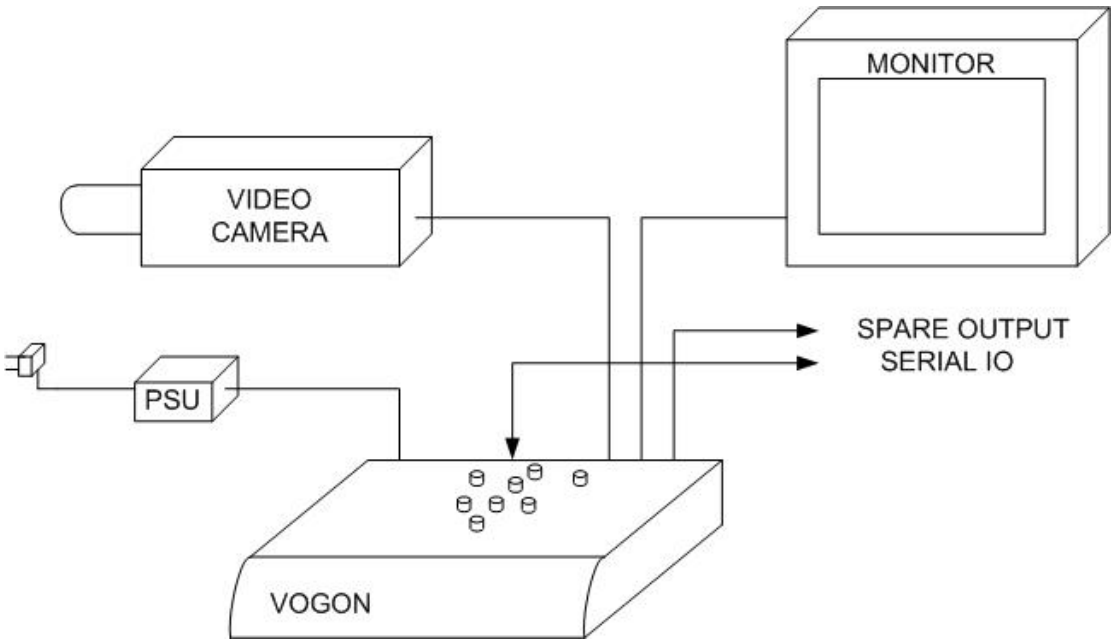


Figure 3: Hardware Setup

- Connect a BNC – BNC lead from the Camera to the Video Input connector on the back of the Vogon unit.
- Connect a BNC – BNC lead from one of the Video output terminals on the back of the Vogon unit to the Video Input connector on the monitor.
- If required connect the spare video output to a second monitor, VCR or Video capture card.
- If required connect the serial port on the back of the Vogon unit to a serial port on a PC using the appropriate cable.
- Connect the PSU to the local mains power supply (100 – 240VAC, 50 – 60 Hz). Connect the mini power connector from the PSU to the power connector on the back of the Vogon unit.

5 – Operation

5.1 – Power Up

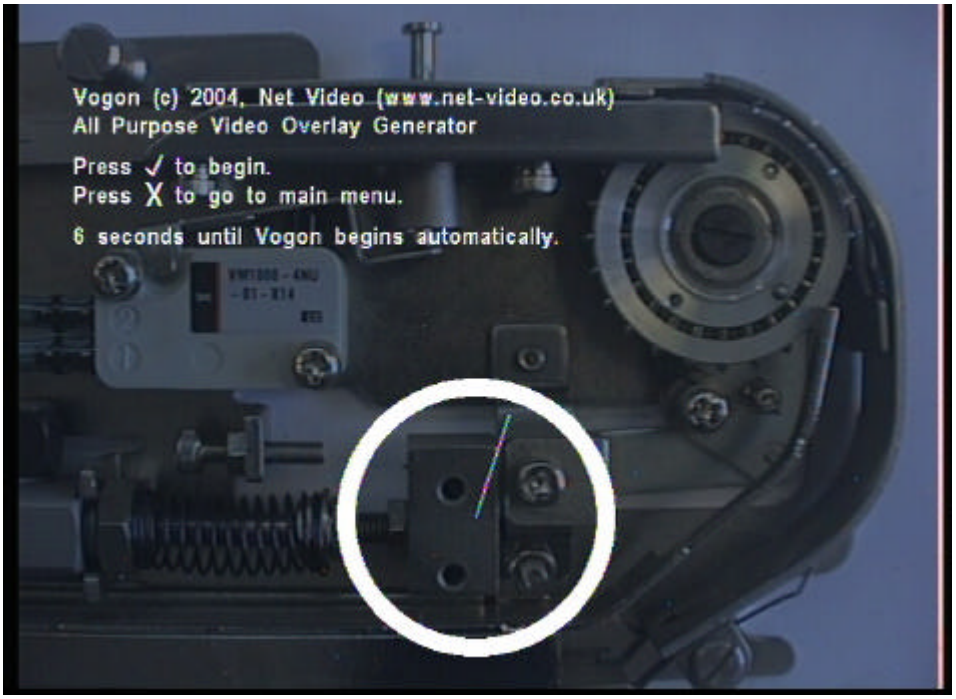

Vogon (c) 2004, Net Video (www.net-video.co.uk)
All Purpose Video Overlay Generator
Press ✓ to begin.
Press X to go to main menu.
6 seconds until Vogon begins automatically.

Figure 4: Start up screen

On power up Vogon runs a diagnostic check on itself, which takes around 3 – 4 seconds. During this time no video overlay will be shown. When the diagnostic check is completed the start up screen will be displayed. Should the diagnostic check fail then the Vogon will reset itself and attempt to restart again.

The user can choose to exit this screen by pressing the MENU button to change settings or the OK button to show the main video overlay screen. After 10 seconds have elapsed the main video overlay screen will be shown automatically.

5.2 – Setting size and position

Vogon can display a combination of up to 2 crosshairs. Only one of these crosshairs can be adjusted at a time.

The active crosshair (the one that is adjustable), is shown as a dashed line. The other crosshair is shown as a solid line.

Pressing the F1 button makes crosshair 1 the active crosshair. Pressing the F2 button makes crosshair 2 the active crosshair. When the active crosshair is changed a prompt is shown for around three seconds stating which crosshair is now active.

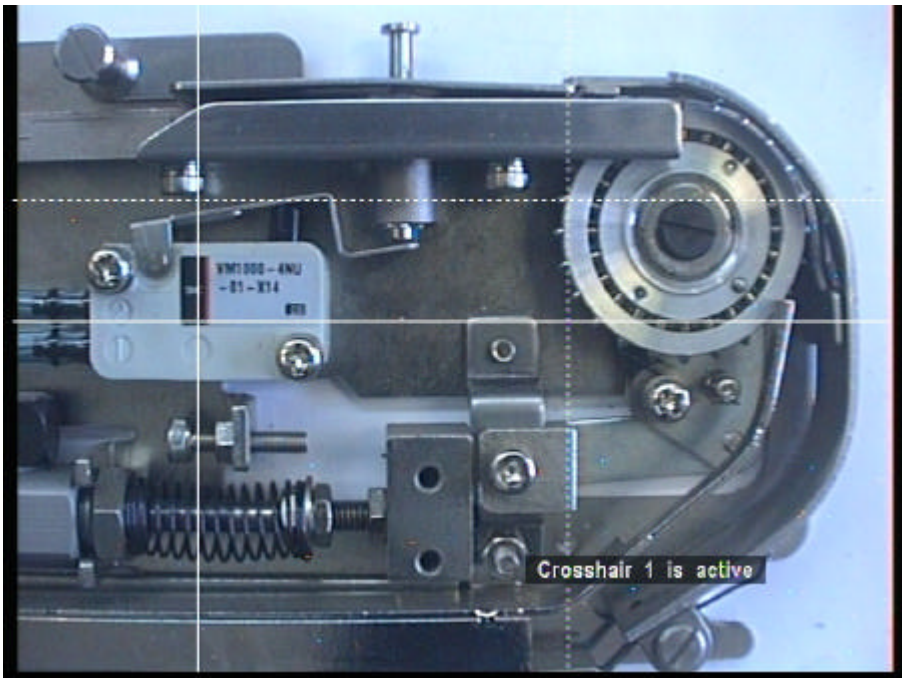


Figure 5: Main video overlay screen showing an active and inactive crosshair.

To set the position of the active crosshair on the screen use the up/down/left/right buttons to move the crosshair to the required position. You can also do this with the rotary controls if available.

To change the 'colour' of the active crosshair press the OK button. The colours available are white, half bright and black.

Half bright mode allows an area of the Video overlay to be shown at half of its original amplitude, thus making the area appear darker whilst still being able to see through it. This has the effect of making areas that are not shown in half bright stand out more against the background.

The principles described in the section of the manual apply for all overlay combinations. For example in box mode pressing F1 allows adjustment of corner 1, pressing F2 allows adjustment of corner 2.

5.3 – Changing settings via the menu

All other settings such as the type of overlay can be changed from a menu which appears when the MENU button is pressed. The menu is navigated by pressing the up or down buttons or using the Y rotary control. Submenus are navigated by pressing the left and right buttons or using the X rotary control. To exit from the menu press the MENU button again.

MENU
Crosshair 1 Display Mode [Crosshair]
Crosshair 2 Display Mode [Crosshair]
Box Positioning Mode [Corners]
Box Fill Mode [Dark Background]
Box Cursor Mode [Timed]
Coordinate Display [Top Right]
Warning Buzzer [On]
Save Current Setup
Restore Defaults
Product Information
Exit Without Saving
Exit And Save

Figure 6: Main Menu.

5.3.1 – Crosshair 1 Display Mode

When this item is highlighted the user can select the type of overlay used for crosshair 1. Five different overlays are available;
Off, Horizontal Line, Vertical Line, Crosshair or Box. Note that in box mode the Crosshair 2 Display Mode automatically switches to Box Mode.

5.3.2 – Crosshair 2 Display Mode

When this item is highlighted the user can select the type of overly used for crosshair 2. Five different overlays are available;
Off, Horizontal Line, Vertical Line, Crosshair or Box. Note that in box mode the X-hair 1 Display Mode also switches to Box Mode.

5.3.3 – Box Positioning Mode

Note: This item can only be selected from the menu if both crosshair display modes are already set to Box mode.

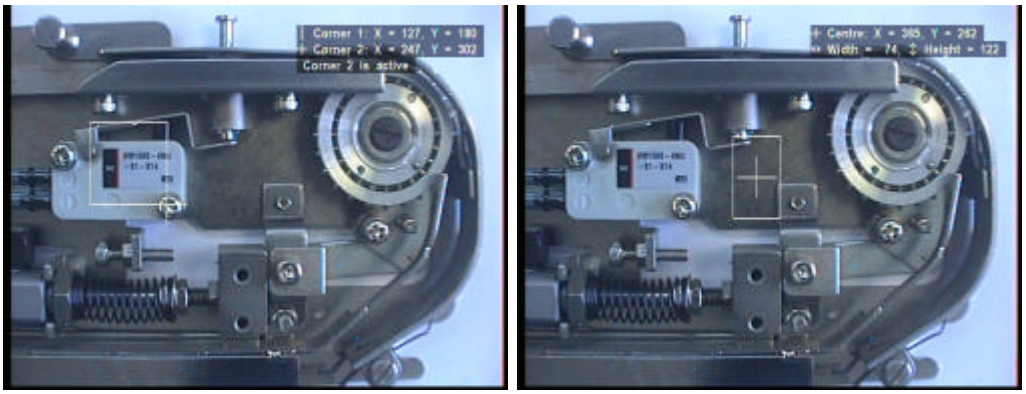


Figure 7: Corner positioning mode and size and position mode.

When this item is highlighted the user can select how to specify the size and position of the box. There are two modes available.

In Corner mode the user specifies the size of the box by specifying the position of two opposite corners. Pressing F1 or F2 allows the user to alternate between which corner they are adjusting. The corner currently being adjusted is marked by a small crosshair.

In Size and Position mode pressing F1 allows the user to adjust the central position of the box, marked by a small crosshair, whilst pressing F2 allows the user to alter the width and height of the box.

5.3.4 – Box Fill Mode

Note: This item can only be selected from the menu if both crosshair display modes are set to Box mode.

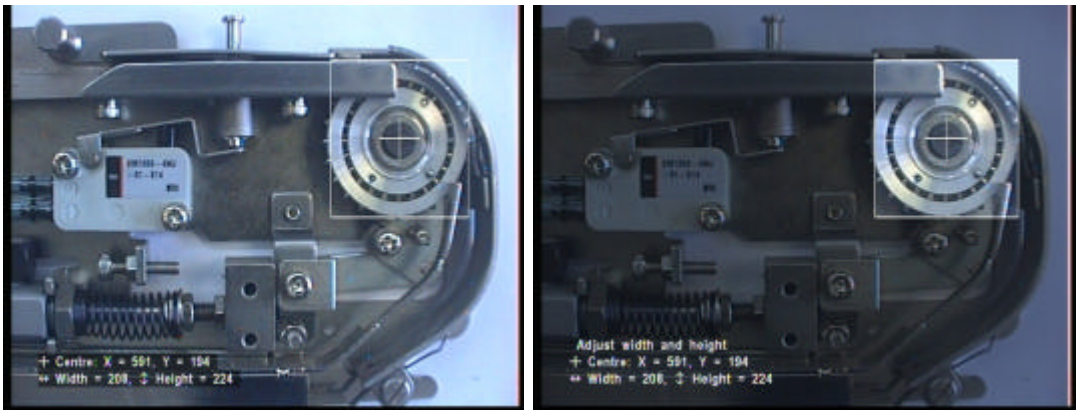


Figure 8: Clear background and dark background when in box mode.

When this item is highlighted the user can select how the background is filled when in box mode. The fill modes available are Clear Background where the area outside of the box is shown the same is the incoming video

stream or Dark Background where the area outside of the box is shown at half the brightness of the incoming video stream.

5.3.3 – Box Cursor Mode

Note: This item can only be selected from the menu if both crosshair display modes are set to Box mode.

When this item is highlighted the user can select whether or not the positioning cursor displayed only in box mode is on indefinitely, off, or on only when the box is being resized and a short while after.

5.3.6 – Coordinate Display

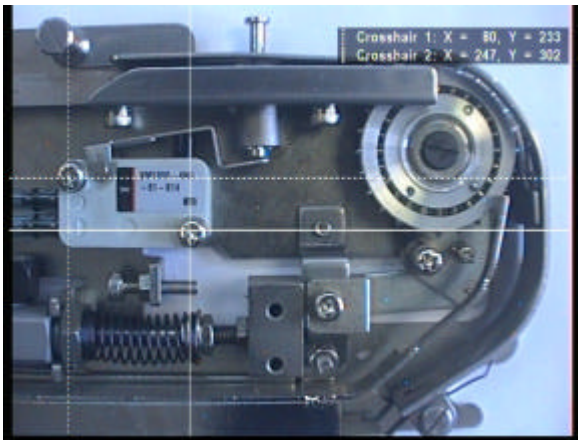


Figure 9: Coordinate display in top right hand corner.

When this item is highlighted the user can select whether or not the coordinate display is shown and its position on the screen. The choices available are: Off, Top Right, Top Left, Bottom Right or Bottom Left.

Note that when displaying coordinates if one of the crosshairs should enter the area where the coordinates are being displayed then the coordinate display will move to the corner diagonally opposite.

All coordinates are specified in terms of pixels (horizontal) and lines (vertical). Vogon uses ‘square pixels’ The horizontal increment size is the same as one video line in the vertical axis.

5.3.7 – Warning Buzzer

When this item is selected the user can specify whether or not the warning buzzer is enabled.

5.3.8 – Save Current Setup

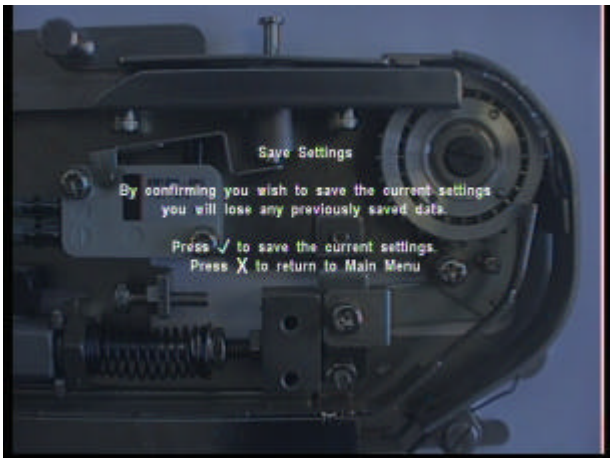

Save Settings
By confirming you wish to save the current settings
you will lose any previously saved data.
Press √ to save the current settings
Press X to return to Main Menu

Figure 10: Save settings screen.

When this item is selected, press OK and a new screen is shown asking the user if they wish to save the current setup.

5.3.9 – Restore Defaults

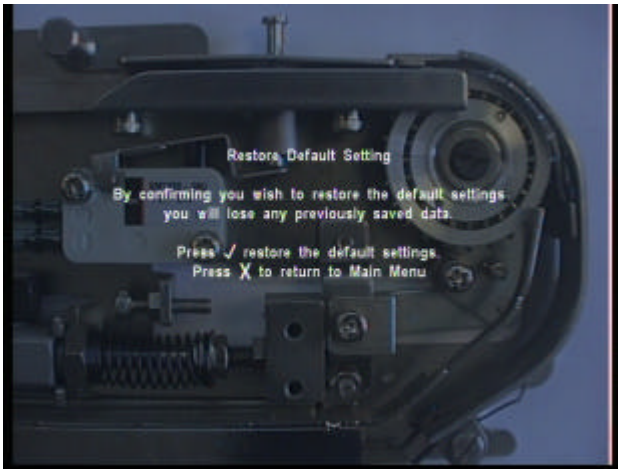

Restore Default Setting
By confirming you wish to restore the default settings
you will lose any previously saved data.
Press √ restore the default settings
Press X to return to Main Menu

Figure 11: Restore defaults screen.

When this item is selected, press OK and a new screen is shown asking the user if they wish to load the default settings that the Vogon unit was supplied with.

5.3.10 – Product Information

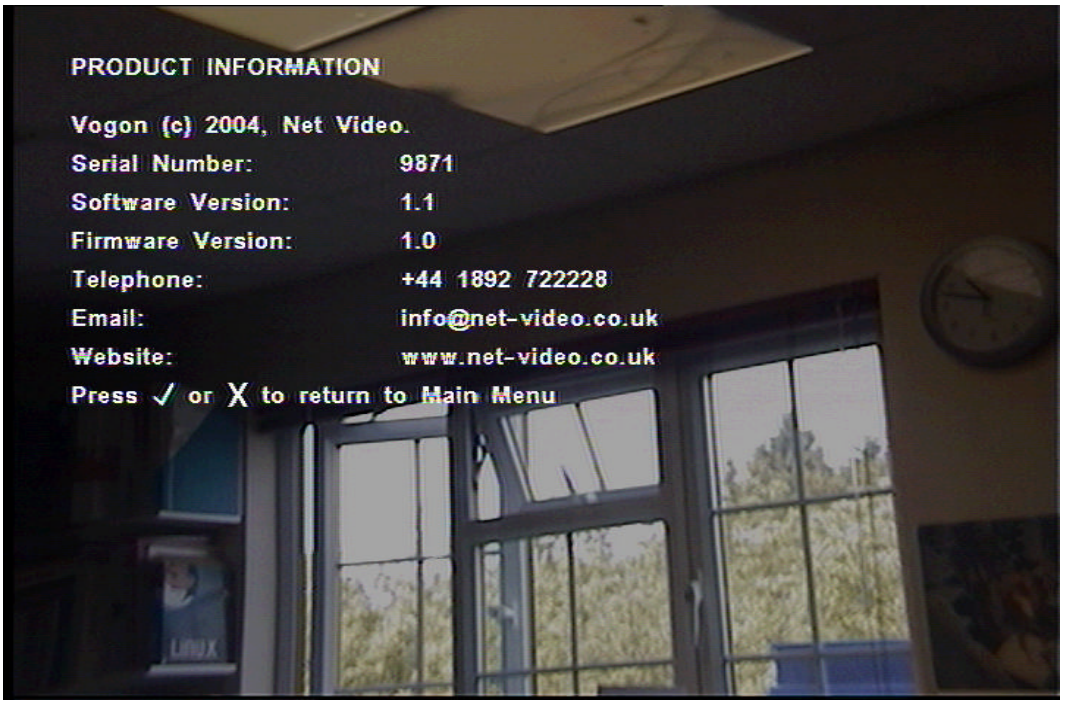


Figure 12: Product Information screen.

When this item is selected, press OK and a new screen is shown displaying information about the product such as the serial number and software version.

5.3.11 – Exit Without Saving

When this item is selected, press OK and the menu is exited and the main video overlay screen is shown but the settings are not committed permanently to memory.

5.3.12 – Exit And Save

When this item is highlighted press OK, the menu is exited, the settings are committed permanently to memory and the ma in overlay is shown. Pressing the MENU button at any time whilst in the menu screen has the same effect.

5.4 – Keypad Enable

The key switch located on the front side of the Vogon unit allows the keypad to be enabled and disabled.

When in the unlocked (keypad enabled) position the Keypad Active LED on the front panel will light up and the position of the crosshairs can be changed using the keypad controls. The user can also enter the menu to change settings.

When in the locked (keypad disabled) position the Keypad Active LED on the front panel will switch off and the crosshairs will no longer be able to be adjusted using the keypad controls. Additionally, as the keypad is locked all settings will be

committed to memory so that each time the unit powers up the same settings will be loaded. The coordinate display is not shown while the keypad is locked and all crosshairs will appear as solid lines.

If the user is in the setup screen and the key switch is turned to the locked position then the unit will immediately show the main video overlay screen.

5.5 – Serial Commands

All the functions that can be achieved using the keypad can also be achieved using serial commands sent from a PC. Additionally the serial commands still work when the keypad has been disabled.

5.5.1 – Setup

The host device sending the serial commands must have the following setup:

- 38400 baud
- 8 data bits
- No parity bits
- 1 stop bit
- No flow control

5.5.2 – Serial Command Set

X1 xxx<CR>:	Set the horizontal (x) position of crosshair 1.
Y1 xxx<CR>:	Set the vertical (y) position of crosshair 1.
X2 xxx<CR>:	Set the horizontal (x) position of crosshair 2.
Y2 xxx<CR>:	Set the vertical (y) position of crosshair 2.
C1 x<CR>:	Set the colour of crosshair 1. (0 = black, 1 = white, 2 = half bright).
C2 x<CR>:	Set the colour of crosshair 2. (0 = black, 1 = white, 2 = half bright).
M1 x<CR>:	Set the display mode of crosshair 1. (0 = off, 1 = horizontal line, 2 = vertical line, 3 = crosshair, 4 = box*).
M2 x<CR>:	Set the display mode of crosshair 2. (0 = off, 1 = horizontal line, 2 = vertical line, 3 = crosshair, 4 = box*).
BUZZ<CR>:	Turn the warning buzzer on or off. (0 = off, 1 = on).
DISP<CR>:	Set the coordinate display mode. (0 = off, 1 = top right, 2 = top left, 3 = bottom right, 4 = bottom left).
CURSOR<CR>:	Set the box mode cursor: (0 = off, 1 = timed, 2 = on).
SAVE<CR>:	Saves the current settings. Reports success or failure.
LOAD<CR>:	Loads last saved settings. Reports success or failure.
DEFAULT<CR>:	Restore factory default settings.
S<CR>:	Query status of unit. Responds with S:V=a, P=b where a is the No Video flag and b is the PLL Lock flag.
V<CR>:	Query software version.
W<CR>:	Query where crosshairs are positioned. Responds with x1, y1,x2, y2, c1, c2, m1 , m2.

?<CR>, H<CR> or HELP <CR>: Shows this list of serial commands.

* When using box mode with serial commands, box dimensions are always specified in terms of corner position i.e. X1, Y1, X2, Y2.

5.5.3 – Command Syntax

More than one command can be entered at a time e.g.

X1 89 Y1 99<CR>

Commands can be in upper or lower case e.g.

X1 89<CR> or x1 99<CR>

All white space and non alphanumeric characters are ignored e.g.

X1=89,Y1=99<CR>

5.6 – Errors

All the while the Vogon unit is switched on it is constantly checking for errors. Routinely the Vogon unit checks for the presence of an incoming video signal, phased lock loop lock and configuration errors within the gate array.

5.6.1 - No video

If the Vogon unit does not detect an incoming video signal it hides its overlay output and will not respond to any action on the keypad until it detects another video signal. The warning buzzer will also sound at half second intervals if it has been enabled.

5.6.2 - No PLL lock

If the Phased Lock Loop (PLL) becomes unlocked the Vogon unit will hide its overlay output and will not respond to any action on the keypad until the PLL has re-locked.

5.6.3 - Gate Array configuration error

If an error occurs with the gate array configuration the Vogon unit will reset itself in order to force the gate array to reconfigure.

6 – Upgrades

Vogon has been designed to be fully reprogrammable so that we can offer upgrades to users who wish to expand the capabilities of the entry level software to perform more advanced functions.

An up to date list of available upgrades can be found at www.net-video.co.uk.

Software upgrades are easily installed using the Net Video Flash Upgrade Tool which is also available for download from Net Video. NOTE: Upgrades to functions that were installed at manufacture or subsequently purchased are free of charge. There is a charge for additional functions.

7 – Specifications

Power Source:	12V DC power supply compatible with 100 – 240VAC, 50 - 60Hz.
Power Consumption:	Approx. 2.4 Watts
Video System:	625 line, 50Hz PAL or 525 line 60Hz NTSC
Video Input:	BNC plug, 1V p-p, 75 ohm termination.
Video Outputs:	BNC plug, 1V p-p, into 75 ohm load.
Picture dimensions:	Full frame, the unit does not blank the video horizontally or vertically.
Measurement resolution:	768 pixels by 576 lines (PAL) 648 pixels by 480 lines (NTSC)
Serial IO port:	Standard RS232 port provided by female 9 way D type connector.
Mouse port:	6 pin mini DIN socket to accommodate standard PS/2 style mouse.
Keyboard port:	6 pin mini DIN socket to accommodate standard PS/2 style keyboard.

A – Joystick Port

Vogon may be controlled remotely, using a standard joy stick with a 9-pin D Type socket. The joystick can be used to move the cross-hair and perform most of the other functions that are performed from the front panel.

The optional joystick connector is located on the left hand side of the Vogon unit and has the following pin allocation:

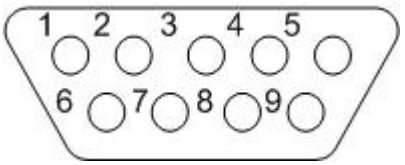


Figure 1: Front view of pin out for the joystick port.

1 – Up	2 – Down	3 – Left
4 – Right	5 – Menu	6 – OK
7 – F2	8 – GND	9 – F1

Only the required controls need to be connected. For example, in an application where it is only necessary to change the X and Y position of the crosshair only pins 1, 2, 3 and 4 need to connected via switches to pin 8 (GND).

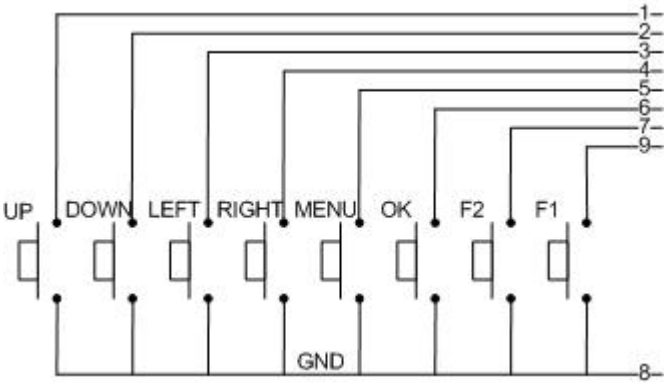


Figure 2: Schematic of suggested joystick wiring.

All used connections on the joystick port should be normally open switch closures to ground.

The joystick connector allows also other equipment to take control of Vogon's features. The switch action may be with a volt-free contact or a NPN transistor arranged to provide a path to ground (Pin 8) when conducting. Vogon has static protection circuits on all eight switch inputs, nevertheless users should take care to ensure that voltages are not applied to the switch inputs outside the range 0 to 3.3V. Each input pin has a 33K pull up resistor to 3.3V. The static input protection consists of a 1K series resistor, a pair of diodes clamping the voltage to power and ground and a 1nF capacitor to ground.

B – GPS time display and Frame count

This document describes special software for the Vogon video overlay generator that enables use of a GPS module to acquire accurate data and time and also display a frame count.

Connecting the GPS

The supplied GPS module connects to the Vogon unit as shown in Figure 1 below.

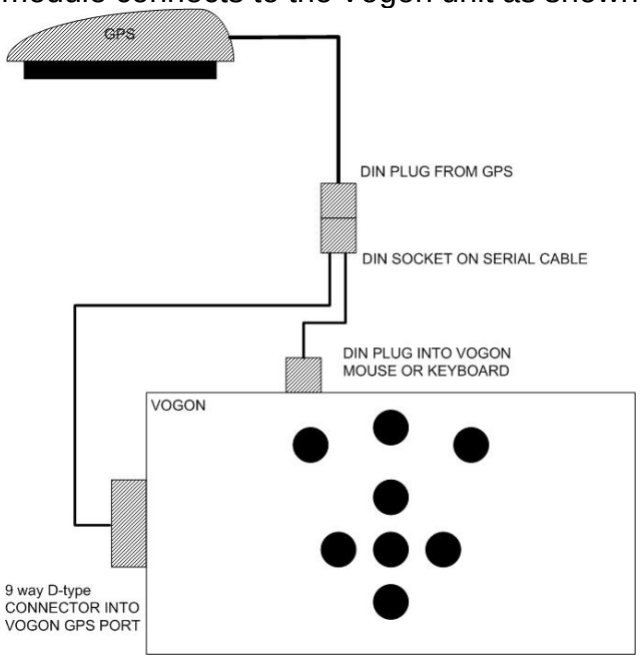


Figure 1: Connecting the GPS to the Vogon

Enabling Time, Date and Frame Count

All settings on the Vogon can be changed either from the main menu (as described in section 5.3) or via serial command (as described in section 5.5).

On the main menu two additional items can be found; **Frame Counter** which lets the user turn the frame counter on or off, and **Date and Time (GPS)** which lets the user turn the Date and Time overlay on or off.

Two additional serial commands are also available, these are **time** and **frame**. Each of these commands must be followed by an argument which is either **0** to turn the item off, or **1** to turn the item on.

When turned on the Time, Date and/or Frame Count will be displayed near the bottom of the screen. When turned off the Time, Date and/or Frame count will be hidden.

Notes

- The displayed time and date is shown in UTC and does not take into account British Summer Time.

- When the Time and Date or Frame Count are displayed the Coordinate display (the position of the crosshair in pixels) is disabled and cannot be turned on again until both Time, Date and Frame Count are disabled.
- When the Time and Date overlay is turned on but the GPS receiver is disconnected the Time and Date overlay will automatically be removed after a second of receiving the last transmission from the GPS.

C – Mounting Kit

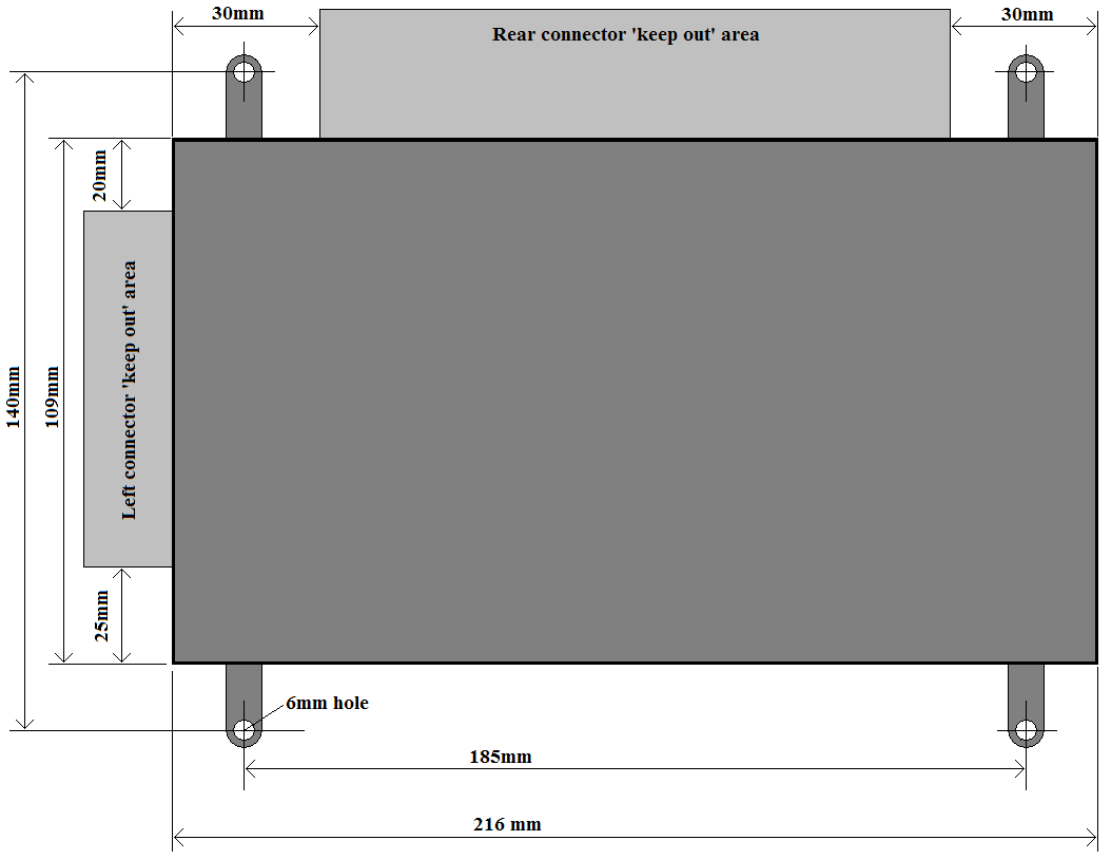
Vogon may supplied with an optional mounting kit to allow surface mounting.

This kit consists of:
2 x Mounting bars.
4 x 5mm bolts.
4 x 5mm shake proof washer.

Attaching the mounting bars requires the removal of the lid of the Vogon and should be carried out by a competent person. The mounting bars are placed underneath the Vogon and the 5mm bolts (+washers) screwed from inside the Vogon.

Once the mounting bars have been attached the Vogon may be surface mounted using four 6mm bolts. The footprint of the Vogon is shown in the diagram below. The exact size of the connector 'keep out' areas will depend on the connector types used and the routing of cables in the final application.

A clearance of 50mm above the mounting surface is required.



D – EMC

Applicability

The following requirements apply only to Vogons that are supplied in metal cases. If the Vogon is supplied as a bare board to be included in the customer's enclosures, then the customer shall be liable to meet the relevant EMC requirements.

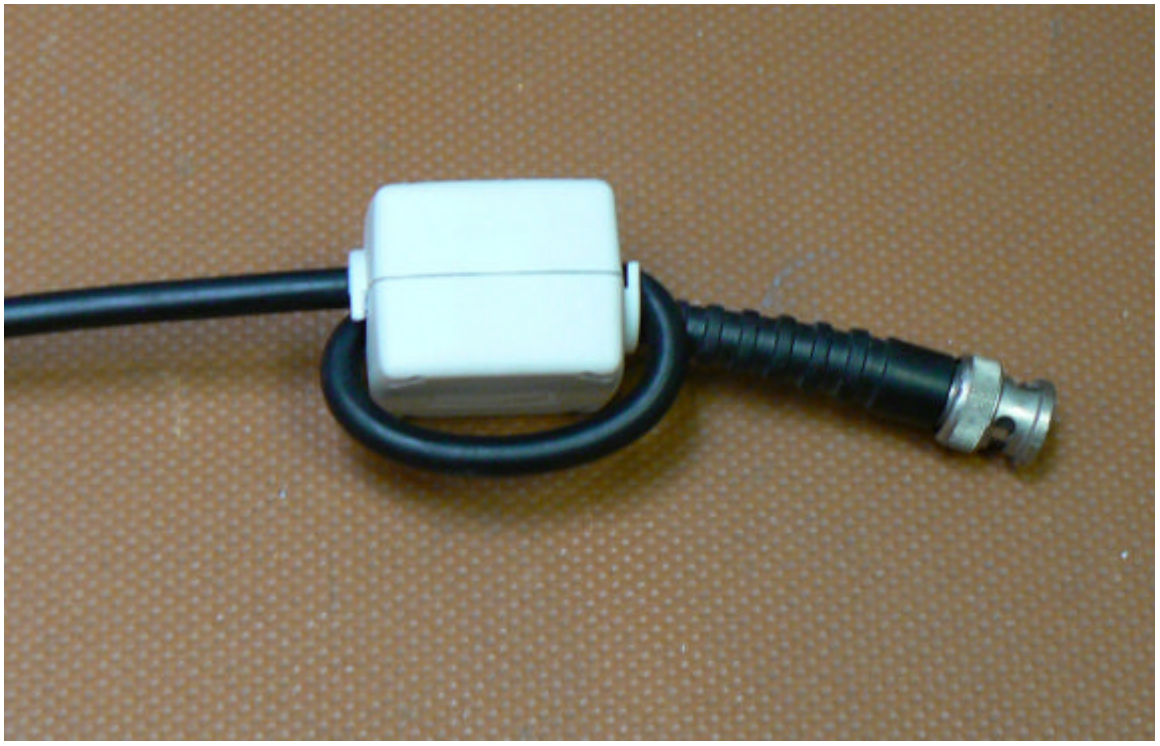
To fully comply with EMC/EEC standards, all connected wiring shall pass through ferrite beads.

The video input and output leads should use a clip-on ferrite - Würth Electronik 742 712 22 or equivalent. There are two essential elements to this assembly:

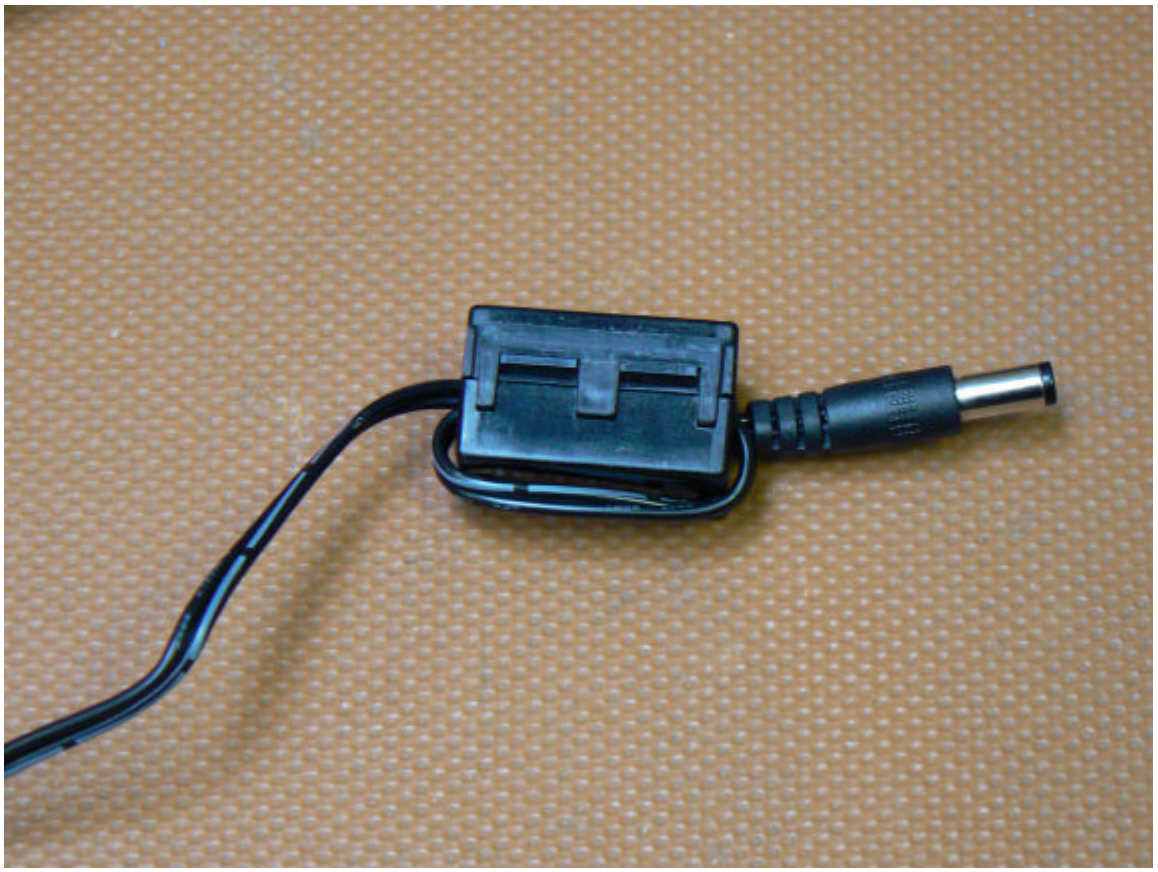
A. The coax cable must pass through the core twice only.

B. The core must be as close as physically possible to the Vogon connector.

The following photograph illustrates these points:



Similarly, the power supply lead must have a ferrite close to the connector with 2 turns through the core. The core should be a Fair Rite 0443167251 or equivalent (Farnell part number 146-3443).



Important: any other leads or cables connected to the Vogon – in particular those plugged into the side panel of the case – should have ferrites clipped on to them in the same way as those clipped onto the video cables. (see earlier)